Corrigé-type 2ème Année 2023

EXO1 :

- $A^2 = \begin{pmatrix} 5 & 4 & -2 \\ 3 & -5 & -4 \\ 24 & 42 & -1 \end{pmatrix}$ (1)

∴ $\det A = -1 \neq 0 \Rightarrow A^{-1} \exists$ (1)

∴ $A^{-1} = \frac{1}{\det A} \cdot {}^t\mathrm{com}A \rightarrow \mathrm{com}A = \begin{pmatrix} 13 & -7 & 19 \\ -6 & 3 & -8 \\ -2 & 1 & -3 \end{pmatrix} \rightarrow {}^t\mathrm{com}A = \begin{pmatrix} 13 & -6 & -2 \\ -7 & 3 & 1 \\ 19 & -8 & -3 \end{pmatrix}$ (1) (0.5)

(1)

$A^{-1} = \begin{pmatrix} -13 & 6 & 2 \\ 7 & -3 & -1 \\ -19 & 8 & 3 \end{pmatrix}$ (0.5)

EXO2 :

- $I = 7\int \frac{x^2+1}{x^3+3x}\,dx = \frac{7}{3}\int \frac{3x^2+3}{x^3+3x}\,dx = \frac{7}{3}\ln|x^3+3x|$ (2)

(φ' ↙, φ ↖)

∴ $J = \int \frac{2x+7}{x^2-3x-4}\,dx = \int \frac{-1}{x+1} + \frac{3}{x-4}\,dx = -\ln|x+1| + 3\ln|x-4| = \ln\left|\frac{(x-4)^3}{x+1}\right|$ (2)

∴ $K = \int_0^1 \left(\int_x^{x^2} x^2 + \frac{y^2}{x} + \sqrt{y}\,dy \right) dx = \int_0^1 \frac{1}{3}x^5 + x^4 - \frac{1}{3}x^3 - \frac{1}{3}x^2 - \frac{2}{3}x^{\frac{3}{2}}\,dx$

$\left[\alpha = x^2 y + \frac{y^3}{3x} + \frac{2}{3}y^{\frac{3}{2}} \right]$ (α ")

$= \left[\frac{1}{3}\cdot\frac{1}{6}x^6 + \frac{1}{5}x^5 - \frac{1}{3}\cdot\frac{1}{4}x^4 - \frac{1}{3}\frac{1}{3}x^3 - \frac{2}{3}\frac{2}{5}x^{\frac{5}{2}} \right]_0^1$

$= \frac{1}{18}x^6 + \frac{1}{5}x^5 - \frac{1}{12}x^4 - \frac{1}{9}x^3 - \frac{4}{15}x^{\frac{5}{2}} \Big]_0^1$

$= \frac{1}{18} + \frac{1}{5} - \frac{1}{12} - \frac{1}{9} - \frac{4}{15}$ (2.5)

$= \frac{-37}{180}$